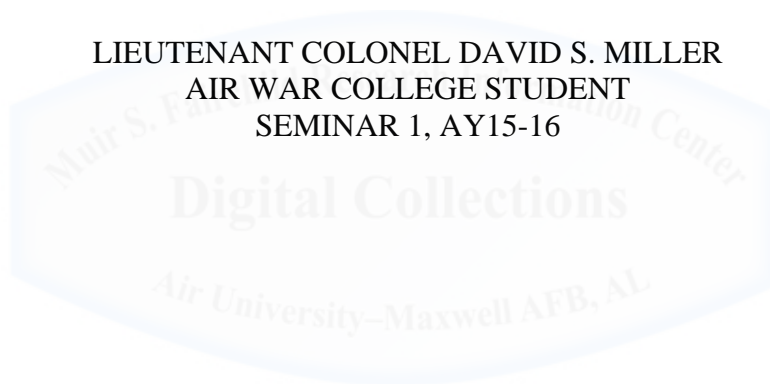


PROFESSIONAL STUDIES PAPER:
SUSTAINABILITY OF THE 21M MISSILE MAINTAINER

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Biography

Lieutenant Colonel David S. Miller entered the Air Force in 1998 as a graduate of the University of Nebraska Air Force ROTC program. He is a munitions maintainer with experience in Peacekeeper and Minuteman III Intercontinental Ballistic Missile weapon systems, as well as nuclear munitions, and conventional munitions maintenance. Lieutenant Colonel Miller holds a Masters of Arts degree in Organizational Management from The George Washington University and a Masters of Philosophy degree in Military Strategy from the School of Advanced Air and Space Studies. He has commanded at the squadron level and completed staff assignments in the Office of the Secretary of Defense and Headquarters Air Force. Lieutenant Colonel Miller is a Joint Qualified Officer having served as a War Planner and Executive Assistant to the Commander, United States Pacific Command. He is currently a student at the Air War College at Air University, Maxwell Air Force Base, Alabama.

Abstract

Mission failure has characterized many high profile incidences in the intercontinental ballistic missile (ICBM) community over the last 10 years. Several in-depth studies have dissected the culture and explored misgivings of the ICBM community. Buried underneath all of the scrutiny is a relatively young munitions and missile maintenance officer career field. The career field is barely 15 years old, and the creation of special identifiers to track and distinguish expertises occurred less than 8 years ago. An objective analysis of the health of the career field is required to ensure changes in the ICBM community do not negatively impact – or are negatively impacted by – the current development of maintenance officers. A thorough review of the health and sustainability of the ICBM maintenance officer career field will reveal conclusions and recommendations that could assist the entire ICBM community in mitigating today's problems and securing the confidence of the service and public.

Introduction

Mission failure has characterized many high profile incidences in the intercontinental ballistic missile (ICBM) community over the last 10 years. Asset accountability, shipping competency, and individual integrity surfaced in the news headlines.¹ Investigations uncovered a “lack of interest...throughout the DoD” and “serious erosion...in expertise” which resulted in process improvements, increased oversight, leadership firings, and the creation of a 4-star command.² The studies, however, lacked an objective analysis of the health of the career field for the officers who handle the ICBM weapon system. As the service continues to grasp for solutions to restore a Strategic Air Command preeminence in the nuclear community,³ it is essential to understand the health of the career field that maintains the missiles. This paper fills that void and was intended to argue the ICBM portion of the munitions and missile maintenance career field as healthy and sustainable, and ready to flourish. However, the evidence presented in this paper will show otherwise.

To understand where the career field is today and where it is trending, it is important to understand its origin. This paper begins with a historical account and a conceptual look at the career field, and is followed by a critical analysis that compares and contrasts whether policy reflects reality. The next section of the paper reviews an Air Force career field that recently went through a transformation and searches for lessons learned, which are applied to an alternative ICBM career field model. The paper closes in offering conclusions and recommendations about improving the health and sustainability of the missile maintenance model.

Career Field History

Origin and Justification

Air Force officers are classified by work requirements and functional expertise with a three digit, alpha-numeric career field identifier or Air Force Specialty Code (AFSC). “It links duties and tasks into cohesive job clusters that are used to match personnel requirements with personal aptitudes, attitudes, and qualifications.”⁴ The first AFSC identifier for munitions and missile maintenance officers is the number “2”, designating Logistics. The second identifier is also numeric, the number “1”, indicating the utilization field. In this case, it represents Maintenance. The third position is an alpha character, the letter “M”, identifying Munitions and Missiles. Taken together, 21M designates a Munitions and Missile Maintenance Officer.⁵

The 21M career field was developed in 1999, and is comprised of three overlapping maintenance disciplines: missiles, nuclear munitions, and conventional munitions. Prior to 1999 those disciplines were separate AFSCs. The decision to combine the career fields stemmed from chronic stovepipe issues.⁶

At the time, munitions was a segment of the aircraft maintenance AFSC. Inside the aircraft sphere of influence, munitions officers found limited leadership opportunities beyond the junior ranks for those with purely munitions experience. This produced an environment limited in its ability to reward or promote long term munitions expertise. For munitions officers to continue to advance and compete for command, they needed to develop deep aircraft maintenance experience and credibility. Consequently, the munitions career field struggled to develop experienced officers in an environment dominated by aircraft maintenance.⁷

By contrast, missile maintenance was a stand-alone career field that did not have a direct accession pipeline. Strategic Air Command utilized an additional duty training program to

award an entry level missile maintenance AFSC for officers that cross-trained from other career fields, usually missile operations.⁸ The process produced a career field rich in weapon system understanding. However, the number of missile units (totaling nearly 50), shrunk considerably in the post-Cold War world, to the 4 bases that exist today.⁹ The declining number of missile bases subsequently led to the downsizing of the career field, and the sustainability was called into question when one-third of the force was cut between 1994 and 1999 (from 300 officers to 200).¹⁰

To sustain the missile maintenance career field, the community considered three options, merge with: (1) missile operations, (2) aircraft maintenance, or (3) munitions maintenance. Informed by the munitions career field experience concerns and the missile maintenance sustainability questions, the senior leaders elected to merge the munitions and missile communities.¹¹ The 21M AFSC created in 1999 is the same one that exists today, and is built on shared principles for safety, security, maintenance practices, and compliance.

By 2008 the 21M career field had a cadre of officers, but there was no formal process to track officer development within and across missile maintenance, nuclear munitions, and conventional munitions maintenance, and hindered the ability to manage the career field. Additionally, inconsistent understanding of important development requirements, like “nuclear expertise,” resulted in misrepresentation of the actual experience.^{12 13}

Finally, in 2008 the career field created special identifiers, referred to as shreds, to track experience and guide career development. Every 21M was assigned a career field shred identifying them as a missile maintenance, nuclear munitions, or conventional munitions maintenance officer. The use of shreds allowed leadership to better manage experience inside the 21M community by developing and tracking officers.¹⁴

In addition, the career field developed special experience identifier (SEI) codes to provide better fidelity on depth of experience.¹⁵ While the shred identifies the primary identity of an officer, the SEI tracks how much time the officer has in that shred. Three of the SEI codes track time in missile maintenance and three additional SEI codes track time in nuclear munitions (each based on 12, 48, and 96 months' experience).

Development

To codify the development of the career field, publications were created to capture the duties, requirements, and qualifications for 21Ms. One such document was the Air Force Officer Classification Directory (AFOCD), which states, a 21M:

Manages maintenance and modification of conventional munitions, nuclear weapons, ICBM, and associated equipment. Administers weapons programs and resources. Directs weapons maintenance production, staff activity, and related material programs. Manages missile maintenance activities at launch and missile alert facilities, including maintenance, repair, and inspection of missile flight systems, expendable launch vehicles, nuclear certified support vehicles and equipment, and associated ground support equipment. Serves as munitions and missile maintenance staff advisor to commanders.^{16 17}

While the AFOCD scopes the career field, the Career Field Education and Training Plan (CFETP) underwrites the processes for deliberately developing 21Ms. Although 21Ms are identified and developed by their specific shred, 8 years ago the CFETP also directed the intentional broadening of maintenance experience by completing assignments across shreds.¹⁸

Commanders, supervisors and the individual officers should strive to fulfill the intent of the functional pairing concept. The functional pairings are predominately ICBM – Nuclear and Conventional – Nuclear; however, the Conventional – ICBM pairing meets this intent. Commanders should take advantage of local broadening opportunities between 21M shreds as circumstances allow.¹⁹

Also within the CFETP is a career field pyramid that illustrates officer positions and training, commensurate with their career timeline (Figure 1). The pyramid portrays the structure of the career field with a wide, deep base of young officers and a smaller pinnacle of senior officers.²⁰ The career field is dependent on a large base of officers to direct maintenance production, with fewer officers in management, and even fewer in leadership positions. Over time, the officers move-up or move-out.

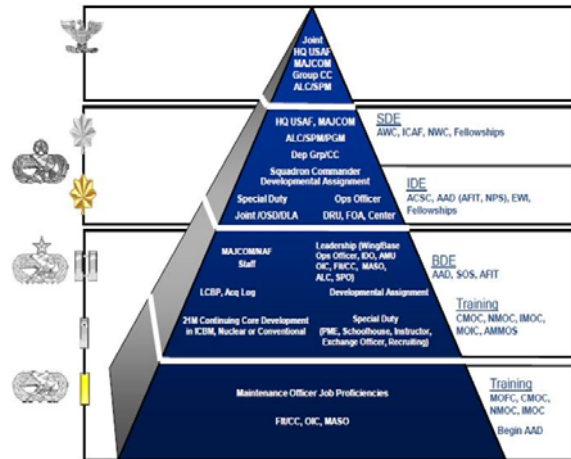


Figure 1: 21M Career Progression Pyramid (Adapted from “Munitions and Missile Maintenance Officer,” CFETP, 3 January 2014, 17.)

Current Status

Manpower Billets

At the time of this study there were 301 21M billets:

Colonels	16
Lieutenant Colonels	62
Majors	67
Captains	119
Lieutenants	37
Total	301

Table 1: 21M Manpower Billets

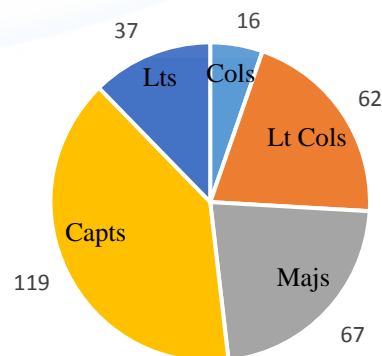


Figure 2: 21M Manpower Billets

There are several surprising indicators with the manpower numbers. The first is the requirement for more than three times the number of Captains as there are Lieutenants, although this has traditionally been rationalized by the long accepted practice of over-manning Lieutenant

billets across the Air Force. Historically, over-manning and accepting officers who cross-trained from other career fields, closed the gap in filling the Captain billets.²¹

There is some risk in not formally identifying the entry level requirements. Failing to document a demand signal could result in a shortage of officers. Since the career field depends on an attrition system (where a larger pool of younger officers are needed to fill a decreasing number of positions within each successively higher rank), the impact of a year or two of lower than expected accession numbers can have cascading implications. The absence of a documented base number reflecting the requirement for accessions makes it problematic for career field managers to predictively manage the career field's long-term health.

The abnormally high percentage of Lieutenant Colonels billets compared to Majors (93%) is also troubling. A sampling of 5 other career fields produced far fewer percentages, ranging as low as 31%.²² The career field becomes dependent on a very high percentage of officers moving from Major to Lieutenant Colonel. When Majors do not promote, gaps incurred at the Lieutenant Colonel rank results in a lack of senior experience that cannot be easily replicated or replaced. This highlights the need for a deliberate plan to identify requirements at each level that support a sustainable and achievable career field model.

Another indicator is the lack of available and experienced senior officers to fill missile maintenance group command positions. Currently, Malmstrom is the only operational unit that has a 21M commander with ICBM experience (dating back to 1999). The 341st Maintenance Group Commander (Malmstrom AFB) cross-trained from missile operations in 1999. The 90th Maintenance Group Commander (F.E. Warren AFB) is a career missile operator who did not broaden into missile maintenance until he was a Lieutenant Colonel in 2007. Finally, the 91st

Maintenance Group Commander (Minot AFB) is an aircraft and munitions maintainer with no ICBM experience.

Manpower Shreds

In addition to understanding the rank distribution, it is also important to study the billet apportionment amongst shreds. Identifying the number of assigned billets by shred proved to be a difficult task, as the latest manning products and tables were not properly populated.²³

Working closely with the career field assignments officer and researching individual billets, the 21M shreds were broken down into the following billets and percentages:

Conventional Munitions	111 / 36.88%
Missile Maintenance	85 / 28.24%
Nuclear Munitions	83 / 27.57%
Missile or Nuclear	4 / 1.33%
Open to Any Shred	18 / 5.98%
Total	301 / 100.00%

Table 2: 21M Shred

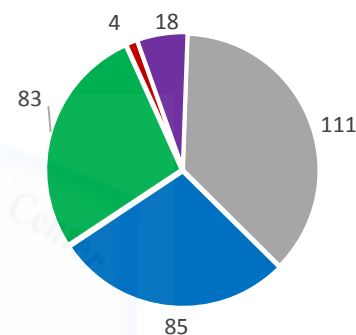


Figure 3: 21M Shred

Despite the few number of ICBM bases, the missile maintenance shred is well represented, accounting for almost 30% of the career field. It is presumed (at a minimum) the same percentage of officers in the career field should possess a core missile maintenance shred. Taking into consideration the pairing plan for developing officers and the age of the career field, the percentage of officers with missile maintenance experience is expected to be much higher than the number of billets.²⁴

Finally, the importance of the ICBM mission and the increased attention on the ICBM community raises the importance of growing senior leader officers with missile maintenance experience. Currently, there is no career track or allocated billets for missile maintenance

officers beyond the rank of Colonel.²⁵ Although the Air Force general officer population is very small, the service should look hard into growing missile maintenance officers into those ranks.

Manpower Strength

Manpower documents for this study showed there were 340 officers in the 21M career field. Those documents included fields for tracking individual officers' shreds and SEIs, but were unfortunately missing information. After scouring the manning documents with the career field assignments officer it was determined 101 of the 340 21Ms had earned missile maintenance shreds and SEIs, comprising 29.70% of the entire career field. Of the 101, only 28 (28%) had SEIs of greater than 48 months' experience, and no officers possessed an SEI of greater than 96 months' experience in missile maintenance. The experience by rank is enumerated below.

Colonels	9
Lieutenant Colonels	27
Majors	23
Captains	35
Lieutenants	7
Total	101

Chart 3: Missile Maintenance

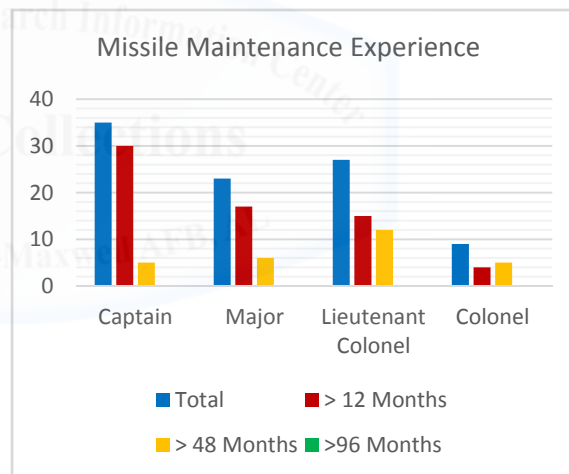


Figure 4: Missile Maintenance Experience

Comparative Analysis

At the macro-level, the number of officers with missile maintenance experience (29.70%) exceeds the number of billets (28.24%), which indicates the career field should be able to meet its requirements. However, there are several factors to consider. First, it presumes all of the experienced officers are available to serve in missile maintenance billets. It is important to highlight that the numbers listed above do not reflect 101 *core* missile maintenance officers.

Rather, there are 101 21Ms with *some* missile maintenance experience. In reality, only 55 are core missile maintenance officers.

While the Lieutenant positions are designed to introduce basic missile concepts and instill fundamental maintenance processes, the higher positions are predicated on being filled by officers with advanced missile maintenance experience. As can be seen in the above Missile Maintenance Experience graph, there is a precipitous drop between Captains and Majors and again between Lieutenant Colonels and Colonels. In a healthy career field one would expect to see a gradual decline in the number of officers to reflect the decreasing number of billets but an increase in the experience levels, especially in the column representing >48 and >96 months.

Another factor not readily visible is the health of each year group. Figure 5 depicts how 18 of the 30 year groups are *at or below* the sustainment line for supporting all three of the 21M shreds.

Knowing several year groups will not meet manning requirements it becomes a matter of prioritizing individual jobs within and between the shreds. One would presume the renewed focus on “reinvigorating

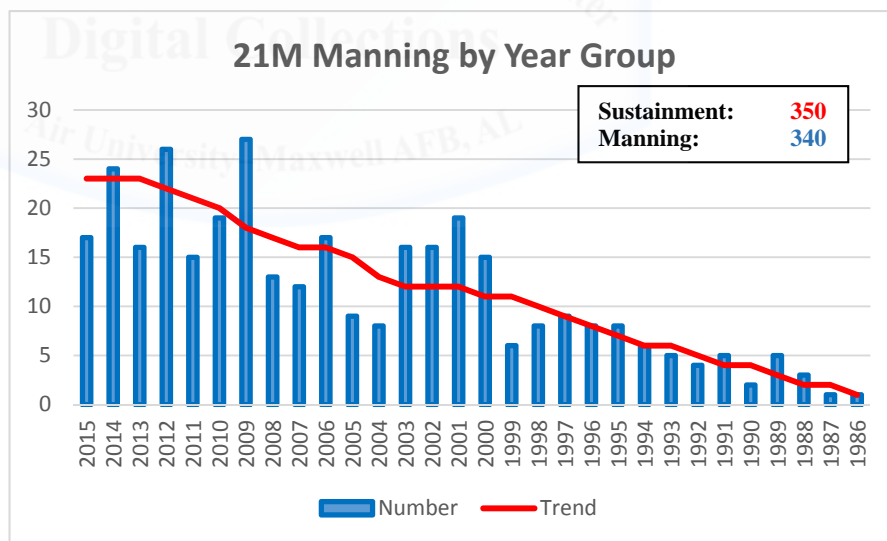


Figure 5: 21M Manning by Year Group
(Adapted and Updated from James Spears, AFPC/DSYA, “21A / 21M Career Health Assessment,” 31 October 2015.)

the nuclear enterprise” would favor filling missile maintenance billets, but the reinvigoration includes missile maintenance as well as nuclear munitions billets.²⁶ Even if those two shreds

received unconditional priority, the conventional munitions billets also require quality officers or risk reverting back to the shallow experience levels that existed prior to 1999. Therefore, it comes down to prioritizing individual billets, which is possible but a time-consuming effort given the perpetual demand to fill billets. Regardless, the year group manning chart represents a concern about long-term sustainability.

Air Force institutional requirements for specialty assignments compounds the shortage of officers. The specialty assignments are positions outside of traditional career fields, such as

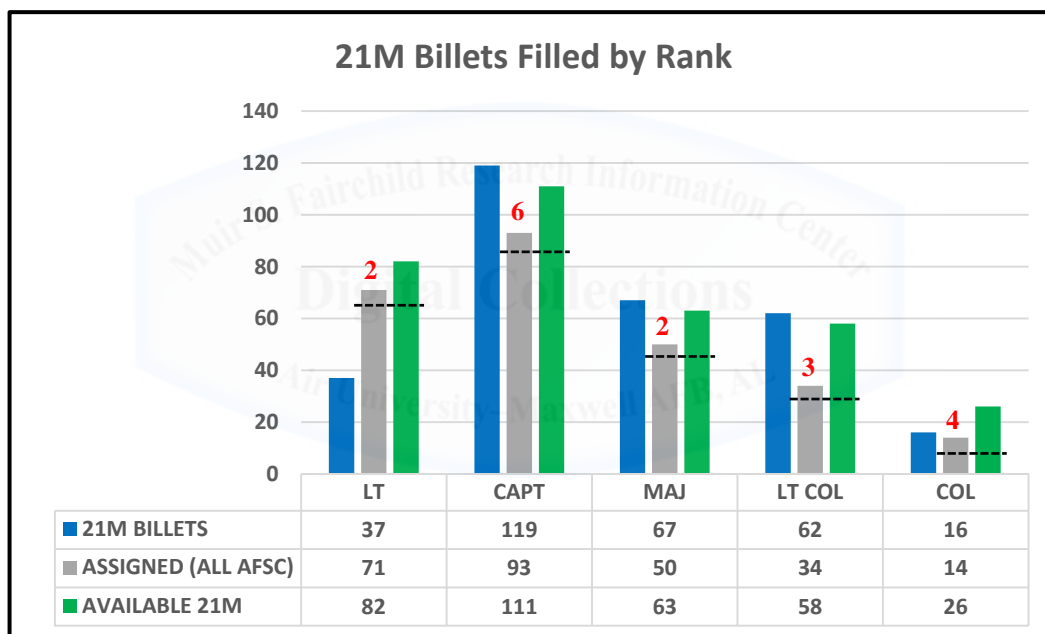


Figure 6: 21M Billets Filled by Rank
(Adapted and Updated from James Spears, AFPC/DSYA, “21A / 21M Career Health Assessment,” 31 October 2015.)

recruiters and instructors. The above chart (Figure 6) depicts the career field’s inability to fill authorized billets after filling institutional requirements. The first column (blue) represents the number of 21M billets to be filled, while the second column (grey) indicates the number of officers across all AFSCs selected to fill those billets. The red number over that column

represents how many non-21Ms are filling 21M billets. The final column (green) depicts how many 21Ms are in the career field, with the portion of the column above the hashed line indicating how many are assigned to non-21M billets (institutional requirements, career broadening, education, etc.).

Even with the assistance from other career fields, the 21M community is unable to fully fill positions above the rank of Lieutenant. The 21M career field fill rates are (with the addition of non-21Ms): Colonels at 87.5%, Lieutenant Colonels at 54.8%, Majors at 74.6%, Captains at 78.1%, and Lieutenants at 192%.

Given the inability to meet current requirements without outside assistance and the number of year groups at or below the sustainment line, the career field will continue to struggle to sustain itself.²⁷

Comparative Model: Cyberspace Operations

Cyberspace operations makes an intriguing comparative model to assess the munitions and missile maintenance career field. It draws its roots from a traditional communications career field, so there are natural similarities and differences between traditional communications and cyberspace operations, much like there are with missile maintenance, nuclear maintenance, and conventional munitions maintenance.

Prior to 2003, communications officers resided in units within mission support groups. Their work centers provided installation support for computer hardware and software, internet installation and support, software design, and electronic devices (telephones, radios, and radar).²⁸ The communications officers supported a wide variety of mission sets but were bonded together by overlapping requirements and shared skill sets. Most importantly, they shared a common functional role of providing mission support to units requiring electronic equipment.

In 2003 the White House published a *National Strategy to Secure Cyberspace*,²⁹ and in 2005 the Air Force adapted its mission statement to include the cyberspace domain, stating “The mission of the United States Air Force is to deliver sovereign options for the defense of the United States of America and its global interests – to fly and fight in Air, Space, and *Cyberspace*”³⁰ (emphasis added). By 2010, traditional Air Force communications officers “ceased to exist” and cyberspace operators were created in their place.³¹ In addition to maintaining their previous career field requirements, they adopted new responsibilities for warfare in the cyberspace domain.

Originally the cyberspace operators were 17Ds and received shreds to designate operations (cyber operations) and maintenance (traditional communications). Later, the shreds were broken into separate AFSCs. The 17D Cyber Control operators continued to provide base level communications support to Air Force installations while 17S Cyber Warfare operators focused on the “more specialized warfare aspects of cyberspace.”³²

Cyber control operators remained in the mission support groups and continued to provide traditional communications maintenance support to base users. They provided support to operators and other support agencies who executed the wing’s mission. There was congruence in the cyber control operators’ *supporting* role – both functionally and by mission focus – so they remained a mission support organization.³³

The cyber warfare operators, however, were pulled from traditional Air Force bases and assigned to wings that specialized in cyberspace operations. While cyberspace wings contained both 17Ds and 17Ss, the two were placed in separate groups. As mentioned previously, 17D Cyber Control officers retained a *supporting* role and remained in mission support groups. The 17S Cyber Warfare officers executed the wing’s mission and therefore possessed a *supported*

functional role and mission focus. They were placed in operations groups. In this instance, the two groups shared an identity as cyberspace operators, but their mission focus (maintenance versus operations) and functional role (*supporting* versus *supported*) were incongruent and they were therefore placed in groups consistent with their functional roles and mission focus.³⁴

Alternative Proposal: 13I ICBM Officer

There is value in considering alternative career field models for missile maintenance officers. Benefits can include discovering lessons learned and best practices to improve the career field, as well as offer an opportunity to assess new proposals or substantiate existing models. One such alternative is bifurcating the 21M community and integrating missile maintenance into missile operations.

A recent article alluded to creating ICBM experts by merging the officer corps from missile maintenance and missile operations.³⁵ The new AFSC (dubbed 13I ICBM Officer for this paper), would replace the 21M and 13N AFSCs to create a multi-talented officer corps comprised of both AFSCs' functional roles, missions, and requirements.³⁶ The cyberspace model offers a lens to view realigning missile maintenance with missile operations.

When evaluating the 13I model it is easy to see the manpower benefits. Whereas 21Ms struggle to fill field grade missile maintenance billets (Major - Colonel), 13Ns have the opposite dilemma. The 13N career field is predicated on the ability to train, qualify, and employ missile crews. Missile operations has a huge demand for junior officers (800 Lieutenants and Captains) but significantly fewer positions for field grade officers (307 Majors and Lieutenant Colonels). The end result is an exodus of missile operators looking for jobs in other career fields.³⁷ The annexation of 85 missile maintenance billets is an enticing solution to an enduring and unresolved 13N dilemma.

The 13N's surplus of officers in the Captain, Major, and Lieutenant Colonel ranks could solve the 21M community's inability to fill missile maintenance billets, but presents several disadvantages to the missile maintenance community. The 13Ns would be "logistically immature" and lack experience leading large enlisted work centers.³⁸ There is a precedence for cross-training officers into missile maintenance (SAC program) but most of the officers who cross into maintenance, especially for command opportunities, are historically not in the top tier of officers in the 13N community.³⁹ The top tier of officers are matched to missile operations command billets before the 21M community solicits other career fields to fill maintenance gaps.⁴⁰ If the merger were to occur, there is reason to believe preferential placement of top-tier officers in the operations billets would continue.

Although missile operators and missile maintainers share many geographical challenges and compliance processes, they do not share functional roles or mission focus. Functionally, the 21M career field and 13N officers are intentionally compartmentalized from one another. Their access to information, procedures, processes, and details of the mission are often deliberately separated. For nuclear surety and security purposes, even if operations and maintenance were combined into one career field, the two would be required to be partitioned and potentially perpetuate a lack of solidarity

Functionally, ICBM operators execute the wing's mission and appropriately reside in operations groups. The missile maintainers enable the operators to conduct the mission and are appropriately placed in maintenance groups. Missile operations is the *supported* unit while missile maintenance is the *supporting* unit. The operations and maintenance units have incongruent missions and functional roles. The idea of combining the two career fields is counterintuitive to aligning units based on functional roles and mission focus, and how the 17D

and 17S career fields are aligned. Forcing incongruent units together would be synonymous with reversing the deliberate decision to separate Cyber Warfare and Cyber Control officers.

Looking through the cyberspace operations lens, the 13I concept does not fit the cyberspace model. Perhaps this is why the 13I proposal, while not a new or original concept, was proposed and rejected in 1999 and in 2010.^{41 42} Additionally, the merger of the two AFSCs could lead to new problems.

The first problem in creating a 13I AFSC is the dilution of expertise. Instead of growing a group of experts to “rebuild our nuclear expertise,” the system would create jacks-of-all-trades who are perpetually undergoing training and refresher courses.^{43 44} The merger would also negate 21M gains in developing expertise.⁴⁵ The second problem in merging 21Ms and 13Ns is the creation of an even smaller voice in the Air Force. Instead of two career fields advocating together within and across the Air Staff directorates, the already small 13N representation would be further isolated from advocate support. The 13I would replace a larger group of experienced advocates with a much smaller group.⁴⁶

Shifting from the 13I proposal, the cyberspace model offers insights into the current alignment of the 21M career field. Just as the 17D AFSC combined legacy communication requirements with the new cyberspace maintenance responsibilities, the 21M methodology, practices, scheduling and tracking of critical items, strict compliance with security and safety, and attention to detail in storage practices and tool accountability share more similarities than differences in the missile maintenance, nuclear munitions, and conventional munitions maintenance disciplines. Although the actual documentation and databases between the nuclear and conventional shreds are not the same, they share the same disciplined practice for accountability and proper handling.

Additionally, the 21M shreds share overlapping roles and use the same skill sets to accomplish the mission, and all three possess functional supporting roles and mission focus in enabling the wing's mission. Like with the cyber control officer model, congruence between functional focus and mission roles determined organizational alignment for the 21Ms outside the operations group.⁴⁷

Recommendations

The number of experienced missile maintenance officers is much lower than expected. Additionally, the level of experience of those officers is also surprising low. Compounding the problem, nearly two-thirds of all 21M year groups are at or below the sustainment level. In spite of a requirement for shred pairing, only 29.70% of the career field possesses any missile maintenance experience, which barely covers the number of missile maintenance billets. Despite being the second largest 21M shred, less than one-third of the career field has deployed to the missile fields. Of the officers with experience, only 28 have more than 4 years' experience (*which in this author's opinion is not a lot of experience*), constituting 8% of the career field. Of the 340 officers, none possess experience of greater than 8 years.

However, there are a number of recommendations that can turn the statistics around and allow the missile maintenance community to flourish. First, a complete revalidation of all 21M billets is required to build a sustainable model. Looking across several career fields⁴⁸ it is evident there is an accepted practice of not identifying and validating the required number of entry level positions.⁴⁹ Either the career field model is important or it is not. If the model is important, it relies on a realistic and informed base for the pyramid. The foundation of the pyramid supports the rest of the structure. If the career field cannot get this basic starting

requirement correct, the 21M community will continue to struggle in meeting its requirements and will be dependent on officers from other career fields.

When comparing the number of Lieutenant accessions to the demand for Captains, it is difficult to fathom why any profession would deliberately under-represent the entry level manning requirements and still expect the career field to sustain itself. The missile maintenance career field has survived thus far by relying on a standard practice of over-populating Lieutenant billets. Forced dependency on unpredictable accession numbers is a poor business practice and complicates the career field manager's job of developing the entire career field. New accessions have been working in undocumented positions for years and it is time to properly document those positions. Building a strategic roadmap for the career field begins with documenting the required number of annual accessions.

In addition to a bottom-up revalidation of the 21M career field billets, the career field also needs an assessment from the top-down to address a lack of general officers with missile maintenance experience. A review of general officers in leadership and logistics positions yielded only three with munitions experience. Only one general officer possessed any missile maintenance experience (3 years as a Captain), and he is a missile operator on the Air Force Global Strike Command staff. The lack of missile maintenance experienced general officers implies a lack of appreciation or worth for the missile maintenance community. This is not a new critique but rather a seemingly ignored insight where "The dearth of missile maintenance General Officers is consistent with anecdotal evidence of prospects for the future."⁵⁰

There are a number of positions in the Air Force where missile maintenance general officers would be ideal leaders. A seasoned missile maintenance officer could lead the Air Force Nuclear Weapons Center. In addition, the Air Force Global Strike Command A4 position is a

logical place to rotate missile maintenance general officers (especially considering half of the command is comprised of ICBM wings and all of the nuclear weapons on alert are in the missile fields). Other logical places for these officers include AFMC Commander, Vice Commander and A4, positions in the HAF A4 and A10, as well as at the Ogden Air Logistics Center. Another possibility would be upgrading the 20th Air Force Vice Commander position to a Brigadier General (like many Numbered Air Forces).⁵¹ Only by addressing the officer pyramid and career path from the bottom-up as well as the top-down can the career field and the missile maintenance community flourish.

Next, the deliberate mapping of shred pairing and the awarding of SEIs needs to be addressed. The small population of 21Ms with missile maintenance experience indicates higher priority needs to be placed on paring with assignments in the missile field. There are two proposals for ensuring the career field develops a healthy and sustainable throng of officers. First, develop a benchmark for the percentage of officers required to have missile maintenance experience at each rank, and actively manage the career field to those numbers. Or second, create a forced pairing where all conventional and nuclear maintenance officers are required to get missile maintenance experience.

One benefit of gaining missile maintenance experience is greater opportunity to command a squadron or group. Conventional munitions maintenance officer billets constitute the largest percentage of the career field, yet there are few conventional munitions squadrons in the Air Force. Thus, there exists a multitude of opportunities to learn about conventional munitions but very few opportunities to command without aircraft credibility. Broadening the pool of experienced missile maintenance officers affords more squadron command opportunities as well as grows a larger group of potential missile maintenance group commanders.

Currently, only one of the three missile maintenance group commanders is a seasoned missile maintenance officer. This is evidence that the community is unable to produce enough qualified missile maintenance officers for important leadership positions. What makes the statistic more significant is the eligibility for maintenance officers to command twice at the group level – an opportunity unique to all the other career fields in the Air Force.⁵² Even with the option to command twice, the 21M community is still unable to fill its missile maintenance group commander requirements in-house. Either one of the recommendations to increase the number of 21Ms with missile maintenance experience will expand the pool of qualified group commander candidates.

Another recommendation is to thoroughly scrub and update all of the 21M personnel records. More accurate data would assist the career field manager in better developing and balancing the 21M community. The top database fields that need attention are the SEI and AFSC fields. Keeping the fields correct and accurate is a never ending job, therefore responsibility for its accuracy best resides with the Major Command A4s and group commanders, and should be updated once a year (before the Developmental Team meets).⁵³

Finally, the manpower billet database also requires attention. The Desired Shred field for billet positions is underutilized. Only 4 of the 301 billets currently prescribe the type of desired 21M shred. Populating the field shows a deliberate consideration for what kind of experience is expected in that position as well as aids in mapping future moves for officers in those particular shreds.

Conclusion

This study initially predicted the missile maintenance community would be trending towards a healthy future, but the evidence does not support that hypothesis. However, despite

the troubling trends in manning and experience, it is not time to dismantle the munitions and missile maintenance community or abandon the shred construct. Through the fundamental changes and recommendations mentioned in this paper, the missile maintenance officer model can become a sustainable model and help lead the ICBM community back to the preeminence it enjoyed during the Cold War.



Notes

¹ Air Force Nuclear Task Force, Major General C. Donald Alston, Director, *Reinvigorating the Air Force Nuclear Enterprise*, 24 October 2008, 2.

² Secretary of Defense Task Force on DoD Nuclear Weapons Management, James R. Schlesinger, Chairman, *Report of the Secretary of Defense Task Force on DoD Nuclear Weapons Management, Phase I: The Air Force's Nuclear Mission*, 18 December 2008, iii.

³ L. Douglas Keeney, *15 Minutes: General Curtis LeMay and the Countdown to Nuclear Annihilation* (New York: St. Martin's Press, 2011), 116-117 & 202.

⁴ AFI 36-2101, *Classifying Military Personnel (Officer and Enlisted)*, 25 June 2013, 5.

⁵ *Ibid.*, 11.

⁶ Colonel (ret) Sandra M. Gregory, "Nuclear Munitions and Missile Maintenance: Officer Attraction and Retention," *Air Force Journal of Logistics*, Volume XXXIII [Numbers 3 and 4], 79.

⁷ *Ibid.*, 79.

⁸ *Ibid.*, 79.

⁹ Maurer Maurer (editor), *Combat Squadrons of the Air Force: World War II* (HQ USAF: Albert F. Simpson Historical Research Center, 1982) and Wikipedia, "List of United States Air Force Missile Squadrons," https://en.wikipedia.org/wiki/List_of_United_States_Air_Force_missile_squadrons (accessed 20 November 2015).

¹⁰ Colonel (ret) Sandra M. Gregory, 79.

¹¹ *Ibid.*, 79.

¹² Major Jeffrey P. Anderson, former AFPC Functional Manager, Logistics Officer Assignments Branch, Air Force Personnel Center. Interview with author, 5 December 2015.

¹³ For example, an officer overseeing the maintenance and accountability of nuclear weapons gained different experience and skills than an officer managing a missile field command-and-control operations center.

¹⁴ Major Jeffrey P. Anderson, interview with author.

¹⁵ *Ibid.*

¹⁶ HQ AFPC/DPSIC, "Air Force Officer Classification Directory: The Official Guide to the Air Force Officer Classification Codes," 31 October 2014, 93.

¹⁷ Career Field Education and Training Plan (CFETP) 21MX, "AFSC 21MX: Munitions and Missile Maintenance Officer," 3 January 2014, 8.

¹⁸ It is difficult to predict how many officers should have missile experience due to factors such as non-traditional pairing, manning requirements for each shred, retirement of prior-service officers, reduction in force actions, and cross-training to other career fields. However, one

should expect that after nearly a decade of growing missile maintainers and pairing between shreds there should be adequate coverage of the manning requirements.

¹⁹ CFETP 21MX, 12.

²⁰ Although the pyramid is a generic guideline for development, there are some aspects that deserve critical critique. The first of which is more cosmetic than substantive but may insinuate a bias within the 21M career field. The AFSC badges on the left hand side of the pyramid prominently display the conventional and nuclear munitions badge, but the missile maintenance badge is noticeably excluded. The timelines for upgrade and awarding of the senior and master badges is the same for all three of the shreds, so it should portray both badges (like on the cover to the CFETP).

The second critique of the career pyramid is the lack of information regarding timing for pairing tours. Although the information is contained in the text of the CFETP, given the importance of pairing (both to the individual as well as the depth and breadth of the 21M career field) the absence of the pairing information is noteworthy. The pyramid should be amended to show preferred timing to get experience inside another shred as well as the timing to return to the core shred.

The final critical critique of the career pyramid is the clear presumption that rank progression stops at the O-6 level. This is symbolic of career advancement inside the 21M community, especially for missile maintenance officers. Similar to most career fields, inside and outside the military, rank at the higher level drives manning requirements for the ranks below. Capping the career field at the O-6 level naturally decreases the need for a large pool at the levels below the general officer ranks. The inclusion of a dotted-line pyramid at the top would more accurately depict the possibility of developing general officers in the 21M community.

²¹ Captain Michael Taddy, AFPC Functional Manager, Logistics Officer Assignments Branch, Air Force Personnel Center. Interview with author, 30 November 2015.

²² Missile Operators were at 56%, Space Operators at 75%, Cyberspace Warfare Officers at 64%, Cyberspace Support Officers at 31%, and Aircraft Maintenance Officers at 82%.

²³ The manpower documents contain a field that lists the Desired Shred, however in a review of the 301 billets, only 4 contained information in the Desired Shred field. While some positions – especially at the more senior ranks – lend themselves to any shred, this field is not getting the attention it needs to assist in managing the career field. Fortunately, information listed in another field, titled Authorized AFSC, partially addresses shred orientation.

REMARKS	AUTH AFSC	DESIRED SHRED (A, I, N)	AUTH POSITION	AUTH GRADE	AUTH UNIT	AUTH LOCATION	AUTH MAJCOM
ENTITLED - BASE	21M3		1C1037821	CPT	7 MUNITIONS SQ	DYESS	ACC (1C)
ENTITLED - BASE	21M3		GS0030951	CPT	341 MISSILE MAINT SQ	MALMSTROM	GLOBAL STRKE (GS)
ENTITLED - BASE	21M3		GS0031154	CPT	90 MISSILE MAINT SQ	F E WARREN	GLOBAL STRKE (GS)
MUST FILL - INSTRUCTOR	21M3		0J0980034	CPT	363 TRAINING SQ	SHEPPARD	AETC (0J)
MUST FILL - ONE DEEP	21M3		1C1033108	CPT	325 MAINTENANCE SQ	TYNDALL	ACC (1C)
ENTITLED - BASE	21M3A	N/A	1C1022742	CPT	1 MAINTENANCE SQ	JB LANGLEY-EUSTIS	ACC (1C)
ENTITLED - BASE	21M3A	N/A	1C0000186	CPT	20 EQUIPMENT MAINT SQ	SHAW	ACC (1C)
MUST FILL - 30C0/KNB	30C0	N or I	0D0027495	LTC	701 MUNITIONS SPT SQ	KLEINE BROGEL	USAFE (0D)
MUST FILL - 30C0/KNB	30C0	N or I	0D0058005	LTC	702 MUNITIONS SPT SQ	BUCHER	USAFE (0D)

²⁴ It is not possible to determine the exact number of officers that should possess missile maintenance experience due factors such as non-traditional pairing, manning requirements for each shred, retirement of prior-service officers, reduction in force actions, and cross-training to other career fields.

²⁵ Colonel (ret) Sandra M. Gregory, “Nuclear Munitions and Missile Maintenance: Officer Attraction and Retention,” Air War College, 24 March 2009, 7.

²⁶ Air Force Nuclear Task Force, title, 33.

²⁷ Although the 2000 – 2003 year groups are above the sustainment line, they only account for 19 officers. That number is far fewer than what is needed to fill the gaps above and below those year groups.

²⁸ Major Joseph R. Golembiewski, “From Signals to Cyber: The Rise, Fall, and Resurrection of the Air Force Communications Officer,” School of Advanced Air and Space Studies, Air University, June 2010, 69-70.

²⁹ Ibid., 79.

³⁰ Master Sergeant Mitch Gettle, “Air Force Released New Mission Statement,” *Air Force Print News Today*, retrieved from http://www.au.af.mil/au/awc/awcgate/af/af_msn_8dec05.htm on 3 December 2015.

³¹ Major Joseph R. Golembiewski, 81.

³² Ibid., 81-82.

³³ Lieutenant Colonel Joseph R. Golembiewski, Air Force Cyberspace Operator. Interview with author, 8 December 2015.

³⁴ Ibid.

³⁵ Colonel Andrew S. Kovich, “Developing and Promoting ICBM Experts,” 2013, 7.

³⁶ There is also discussion of combining Security Forces with Missile Operations and Missile Maintenance. This study will not address Security Forces’ positions or equities.

³⁷ To further illustrate, there are 474 13N Lieutenant billets but only 326 Captains billets (a 31% reduction), 197 Majors billets (a 40% reduction from Captain), and 110 Lieutenant Colonel billets (a 44% reduction from Major).

³⁸ Colonel Kim Brooks, Headquarters U.S. Air Force A4LW, “13N & 21M Merger Proposal Informational Brief to AF/A4L,” November 2015, 5.

³⁹ Colonel Andrew S. Kovich, 8.

⁴⁰ Ibid., 8.

⁴¹ Colonel (ret) Sandra M. Gregory, *Air Force Journal of Logistics*, 79.

⁴² Major Jeffrey P. Anderson, former AFPC Functional Manager, Logistics Officer Assignments Branch, Air Force Personnel Center. E-mail to author, 5 December 2015.

⁴³ Air Force Nuclear Task Force, 4, 14, 22.

⁴⁴ Major Jeffrey P. Anderson, E-mail to author.

⁴⁵ Colonel (ret) Geoff Bacon, Headquarters U.S. Air Force A4LW, “13N & 21M Merger Proposal Information Brief to AF/A4L,” 28 March 2008.

⁴⁶ The concept of merging the 21Ms and 13Ns also flies in the face of the Air Force Nuclear Task Force recommendation to “ensure excellence in *every mission discipline*” (emphasis added), not consolidate every discipline. (Air Force Nuclear Task Force, 34.)

⁴⁷ The merger of missile maintenance with missile operations requires thoughtful analysis of whether a weapon system culture is more important than a maintenance culture.

⁴⁸ Author reviewed accession plans for 13S, 21M, 21R, and 65F career fields.

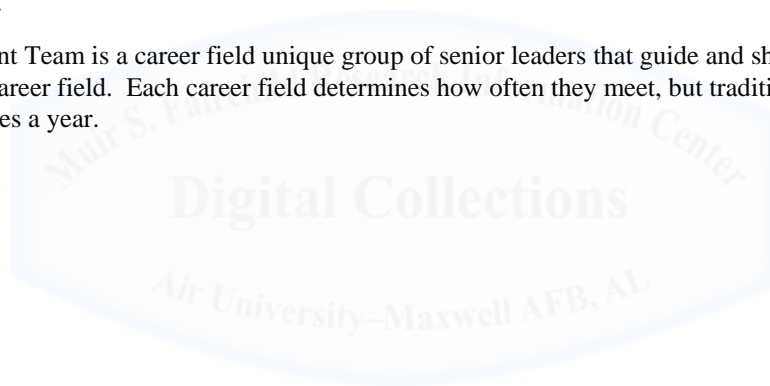
⁴⁹ Major Thomas Cook, former Financial Management Career Field Manager, Financial Management Branch, Air Force Personnel Center. Interview with author 3 December 2015, and author’s review of the Air Force’s Assignment Management System database.

⁵⁰ Colonel (ret) Sandra M. Gregory, Air Force Journal of Logistics, 82.

⁵¹ Even if the billet is not raised to an O-7 position, it could be a competitive location for senior Colonels approaching their promotion board. Currently the 20th Air Force Vice Commander is held by a Special Tactics Officer with no nuclear or ICBM experience.

⁵² This is a telling statistic that the entire maintenance community manning model may need a thorough review.

⁵³ A Development Team is a career field unique group of senior leaders that guide and shape the career path for the officers in that career field. Each career field determines how often they meet, but traditionally they gather together about 3 times a year.



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